

Eggplant-pearl millet rust - *Puccinia substriata*

This warm temperate tropical rust produces an aecial stage on Solanum including eggplant and the uredinial and telial stages on various species of Poaceae especially pearl millet. This rust appears to be restricted to Africa and the western hemisphere where it has recently become especially damaging in no-till farming systems in central Brazil (Carvalho et al., 2006).

Puccinia substriata* var. *substriata Ellis & Barthol. 1897

Anamorphic stage: *Aecidium tubulosum* Pat. & Gaillard, 1888

Aecia hypophyllous (on the lower side of the leaf), spots brown, cup shaped sorus; aeciospores 26-30 × 21-27 µm. Wall 1-1.5 µm thick, verrucose, pale orange.

Uredinia amphigaeous or mainly abaxial surface, cinnamon-brown; spores 24-31 × 24-27 µm, mostly broadly ellipsoid or obovoid, wall 1.5-2 µm thick, cinnamon brown, echinulate, germ pores 3-5, equatorial.

Uredinia hypophyllous (on the lower side of the leaf), sometimes amphigenous, scattered, elliptic, 0.3-0.8 mm long, cinnamon-brown, epidermis opening broadly by longitudinal or irregular rupture; urediniospores broadly ellipsoid or obovoid, 23-30 × 28-36 µm; wall cinnamon-brown, 1.5-2 µm thick slightly thicker above, moderately echinulate; pores usually 4, less commonly 2, rarely 4, equatorial or slightly below, slightly constricted at septum, 19-26 × 33-50 µm; wall chestnut-brown or frequently golden-brown in tropical collections, 1.5-2 µm thick at sides, 3-7 µm at apex, smooth; hyaline or yellowish.

Telia mostly on abaxial surface, exposed, compact, dark brown; teliospores 34-50 × 20-26 µm, mostly oblong ellipsoid, or clavate, wall 1.2-2 µm thick at sides, 3-7 µm apically, chestnut brown.

See Cummins (1971) for a more detailed description.

Host Range Telial stage on Poaceae: *Axonopus compressus* (Sw.) P. Beauv. *Digitaria ciliaris* (Retz.) Koeler *Digitaria californica* (Benth.) Henrard *Digitaria cognata* (Schult.) Pilg. *Digitaria eriantha* Steud. *Digitaria horizontalis* Willd. *Digitaria insularis* (L.) Fedde *Digitaria sanguinalis* (L.) Scop. *Digitaria* spp. *Echinochloa polystachya* (Kunth) Hitchc. *Eriochloa punctata* (L.) Desv. ex Ham. *Eriochloa polystachya* Kunth *Megathyrsus maximus* (Jacq.) B. K. Simon & S. W. L. Jacobs *Panicum antidotale* Retz. *Paspalum setaceum* Michx. var. *ciliatifolium* (Michx.) Vasey *Paspalum conjugatum* P. J. Bergius *Paspalum coryphaeum* Trin. *Paspalum densum* Poir. *Paspalum densiflorum* Doll *Paspalum fasciculatum* Willd. ex Flugge *Paspalum fimbriatum* Kunth *Paspalum floridanum* Michx. *Paspalum floridanum* Michx. var. *glabratum* Engelm. ex Vasey *Paspalum hartwegianum* E. Fourn. *Paspalum macrophyllum* Kunth *Paspalum maritimum* Trin. *Paspalum millegrana* Schrad. *Paspalum multicaule* Poir. *Paspalum malacophyllum* Trin. *Panicum millegrana* Poir. *Paspalum mandiocanum* Trin. *Paspalum notatum* Flugge *Paspalum pilosum* Lam. *Paspalum plicatulum* Michx. *Paspalum pubiflorum* Rupr. ex E. Fourn. *Paspalum quadrifarium* Lam. *Paspalum regnellii* Mez *Paspalum remotum* J. Remy *Paspalum scrobiculatum* L. *Paspalum setaceum* Michx. *Paspalum setaceum* Michx. var. *stramineum* (Nash) D. J. Banks *Paspalum* spp. *Paspalum urvillei* Steud. *Paspalum virgatum* L. *Pennisetum glaucum* (L.) R. Br. (pearl millet) *Pennisetum polystachion* (L.) Schult. *Pennisetum stramineum* Peter *Physalis acutifolia* (Miers) Sandwith *Setaria longiseta* P. Beauv. *Setaria macrostachya* Kunth *Setaria parviflora* (Poir.) Kerguélen *Setaria pumila* (Poir.) Roem. & Schult. subsp. *pumila* *Setaria parviflora* (Poir.) Kerguélen *Setaria setosa* (Sw.) P. Beauv. *Setaria* spp. *Setaria setosa* (Sw.) P. Beauv. *Setaria tenax* (Rich.) Desv. *Setaria verticillata* (L.) P. Beauv. *Trichachne* spp. *Urochloa texana* (Buckley) R. D. Webster *Urochloa mutica* (Forssk.) T. Q. Nguyen

Notes Patouillard & Gaillard (1888) reported the aecial stage of this fungus as *Aecidium tubulosum*. Whetzel & Olive (1915) suggested that *A. tubulosum* was associated with *Puccinia substriata* Ellis & Barth. In 1918, Tomas proved that *A. tubulosum* was *Puccinia substriata* by artificial inoculation experiments. In the same year, Arthus (1918b) reported this fungus as *P. tubulosa* and later agreed that *A. tubulosum* on *Solanum torvum* was actually *P. substriata*.

Geographic distribution Africa, North America (Caribbean, Central America, Mexico, USA), South America

Additional illustrations <http://www.apsnet.org/online/Archive/2009/IW000100.asp>

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Uredinia of *P. substriata* on *Setaria* sp. by LM ($\times 10$) BPI 106151



Urediniospore of *P. substriata* on *Setaria* sp. by LM
($\times 400$, Scale bar: 30 $\frac{1}{4}$ m) BPI 106151

